IN THE CLAIMS

The following listing of the claims is provided in accordance with 37 C.F.R.§1.121:

1. (currently amended) A method for modeling electric arc behavior, said method comprising the steps of:

determining electrical conductivity distribution in an arc based upon a temperature distribution and a pressure distribution within an arc chamber in which are disposed a stationary contact, a movable contact and a plurality of adjacent arc chute plates; and

determining a current density distribution of the arc based on the determined electrical conductivity.

2. (canceled).

3. (currently amended) A method according to claim ~~Claim~~ 1 wherein determining current density distribution comprises the step of determining electrical potential of the arc.

4. (currently amended) A method according to claim ~~Claim~~ 1 further comprising the steps of:

determining magnetic fields and Joule heating using the determined current density distribution; and

determining magnetic forces from the determined magnetic fields.

5. (currently amended) A method according to claim ~~Claim~~ 4 further comprising the step of determining gas dynamics field using the determined Joule heating and magnetic forces.

6. (currently amended) A system for modeling electric arc behavior, said system comprising:

at least one computer configured to determine at least an electrical conductivity distribution in an arc within an arc chamber based upon a temperature distribution and a pressure distribution within the arc chamber in which are disposed a stationary contact, a movable contact and a plurality of adjacent arc chute plates, or a current density distribution of the arc based on the electrical conductivity distribution in the arc.

~~a server computer;~~

~~a first client computer coupled to said server computer, said first client computer programmed to determine electrical conductivity distribution in an arc; and~~

~~a second client computer coupled to said server computer, said second client computer programmed to determine a current density distribution of the arc based on the determined electrical conductivity distribution.~~

7. (canceled).

8. (currently amended) The system according to claim 6, wherein the at least one computer is configurable to determine an electrical potential of the arc. ~~A system according to Claim 5 wherein said second client computer is programmed to determine electrical potential of the arc.~~

9. (currently amended) The system according to claim 6, wherein the at least one computer is configurable to determine joule heating and/or magnetic fields based on the current density distribution. ~~A system according to Claim 5 wherein said second client computer is further programmed to determine magnetic fields and Joule heating using the determined current density distribution, and magnetic forces from the determined magnetic fields.~~

10. (currently amended) The system according to claim 9, wherein the at least one computer is configurable to determine a gas dynamics field based on at least the joule heating or the magnetic fields. ~~A system according to Claim 9 wherein said second client computer is further programmed to determine gas dynamics field using the determined Joule heating and magnetic forces.~~

11. (new) ~~A~~ Computer readable media, comprising:

code adapted to determine at least an electrical conductivity distribution in an arc within an arc chamber based upon a temperature distribution and a pressure distribution within an arc chamber in which are disposed a stationary contact, a movable contact and a plurality of adjacent arc chute plates.

12. (new) The computer readable media of claim 11, further comprising code adapted to determine a current density distribution of the arc based on the electrical conductivity.

13. (new) The computer readable media of claim 12, further comprising code adapted to determine magnetic fields and Joule heating using the current density distribution.

14. (new) The computer readable media of claim 13, further comprising code adapted to determine magnetic forces from the magnetic fields.